EAB

Who Should Read

CIOs and Senior IT Leadership

Human Resources Managers

IT Hiring Managers

Developing Hard-to-Hire IT Skillsets

Training and Staff Development Tactics for the Emerging Higher Education IT Workplace

Study in Brief

Higher education IT operates at a disadvantage in today's highly competitive talent marketplace. To a large extent, skills related to cloud, cybersecurity, BI, and other essential aspects of the emerging IT environment will have to be developed internally. This brief profiles tactics that CIOs, HR, and hiring managers can use to activate the IT workforce and develop hard-to-hire skillsets.

5 Ways to Use This Research

1. Understand the factors driving change in IT skills needs and the emerging talent gap
2. Communicate the importance of next-generation skills to staff and managers
3. Adjust team structures and promotion practices to broaden skills throughout the IT organization
4. Use on-the-job training of existing staff to fill hard-to-hire positions
5. Implement strategies to coordinate with HR to enact new promotion and development policies

The Next-Generation IT Environment Arrives

The IT environment is undergoing once-in-a-generation change. Long employed mainly at the periphery, cloud services increasingly provide core business and infrastructure services. AI is beginning to have real-world impacts, and Agile development methods are reshaping the way IT interacts with customers. Taken together, these changes are driving down demand for some familiar IT roles, while putting a premium on emerging skillsets.

AN EMERGING ENVIRONMENT

New Computing Paradigm

Virtualized assets run or mediated by vendors, not on premises

Digital Transformation

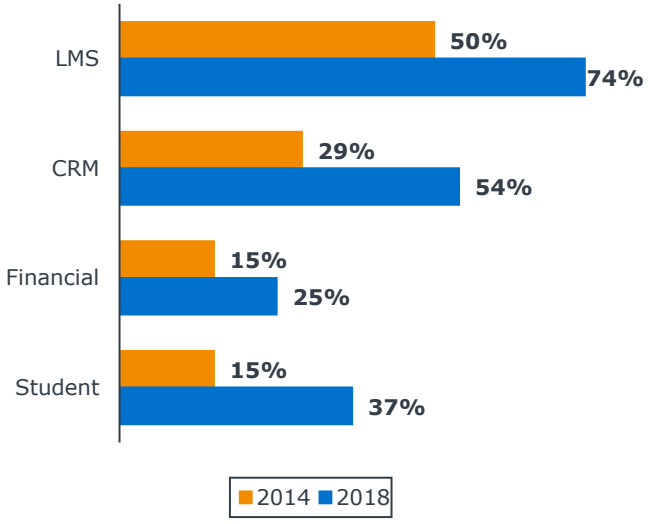
IT and customers aim for fundamental business process change

Process Automation

AI and machine learning begin to replace human cognition

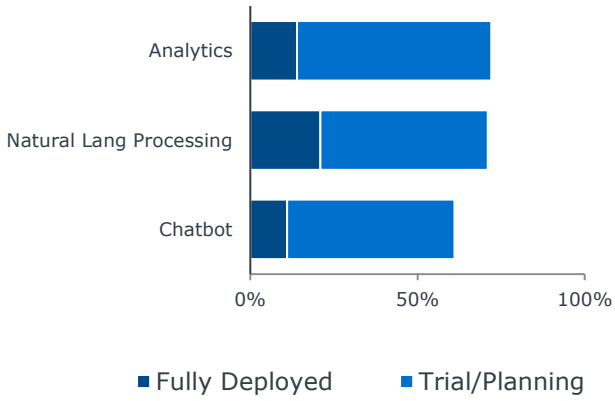
Cloud Adoption Going Mainstream

Enterprise-Wide Systems Cloud Penetration



AI Making Real-World Inroads

Status of AI-Related Projects



"Systems administrators won't disappear from my organization, but the number I need will go down and their responsibilities will be different.

The next transition is to move all servers off-prem to the cloud. Most staff will have to learn a new skillset of indirect server management. This training is a non-stop effort."

CIO

Public Research University

Source: Ovum, *2019 Trends to Watch: Higher Education;* Hewlett Packard, *Agile is the New Normal;* EAB Interviews and Analysis.

Hiring Cannot Solve Workforce Gaps

Changing skills needs are nothing new in IT, but there are good reasons to believe that the skills revolution now underway is far more disruptive than the incremental change we are accustomed to. A McKinsey analysis finds that about a third of the core skills required in technology positions have changed in type or priority in the last five years. Many IT jobs also are being reshaped by a global trend in professional employment, the need to supplement hard technical skills with soft skills including communication, team-building, and relationship management.

The impact of the new environment is plain in the IT talent marketplace, where cloud-related items account for three of the five most in-demand skillsets. Institutions will struggle to hire their way into meeting the new demand in these areas, given a 30% salary shortfall compared to industry averages and fierce competition for qualified applicants. Higher education's traditional quality-of-life advantages may not be enough to compensate, especially in light of the enrollment and revenue declines many institutions are facing.

As Work Undergoes Transformation, Competition Heats Up for Cloud Skills

A CHANGING SKILLS SCENE

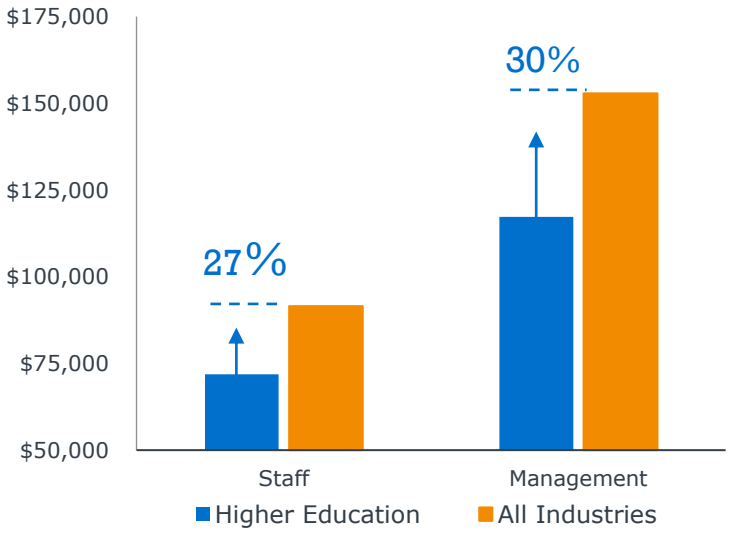
35% Core IT Skills Changed, 2015-2020

3 Cloud-related Items Among Top 5 In-Demand IT Skills

+26% Social Skills Demand Increase by 2030

Higher Ed Falls Short on IT Salaries…

Mean Annual IT Salaries



…And Yes, It Matters

78%
CIOs finding it hard-to-hire/retain IT talent

4:1
Job postings per hire in higher education IT

314,000
Unfilled US cybersecurity positions in 2019

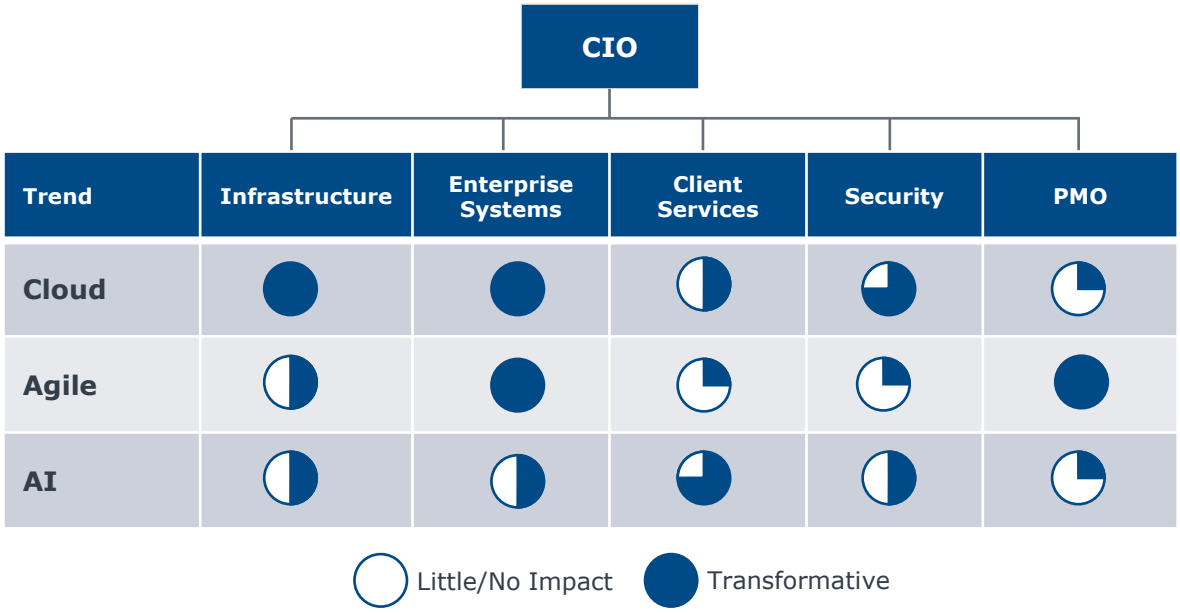
Source: McKinsey, *Introducing the Next-Generation Operating Model*; Robert Half, The State of U.S. Tech Hiring; Campus Computing Project, *2019 Campus Computing Survey*; McKinsey, *Skill Shift: Automation and the Future of the Workforce*; US Bureau of Labor Statistics; CSIS, *The Cybersecurity Workforce Gap*; EAB Interviews and Analysis

Obliged to Grow What We Can't Hire

The ongoing technology transition affects positions across all units that make up a typical IT organization. Given the scale of the change and the realities of the talent marketplace, IT organizations will have to be sparing about hiring cutting-edge talent, and CIOs will have to apply a familiar question—"Buy or build?"—in a new context.

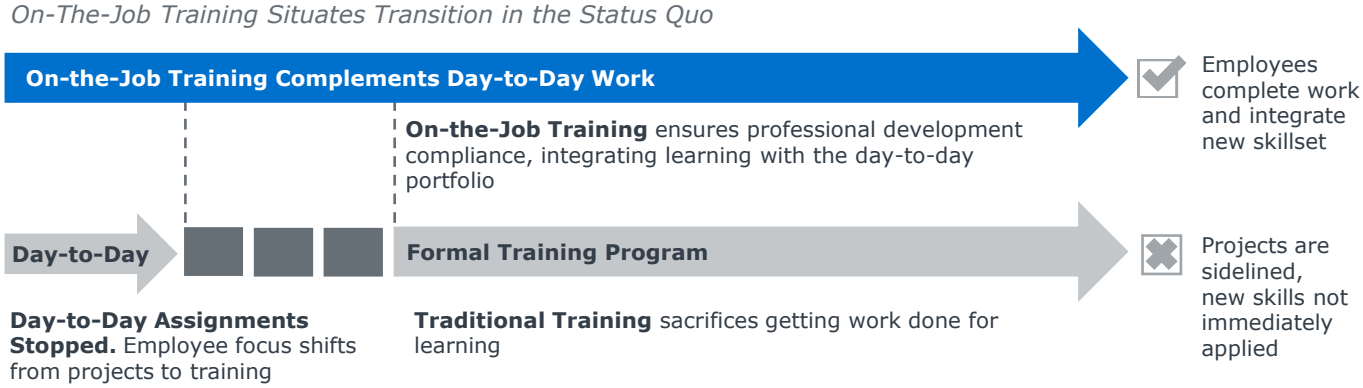
Most of the solution will have to come from internal development. Academic programs and traditional training will each have their place, but IT organizations must also reshape work so that it broadens staff exposure to new ideas. On-the-job training will be essential because it keeps people productive while they learn and allows new skills to be applied immediately. Apprenticeships can grow skills internally that are hard to hire.

Every Aspect of IT Undergoing Skills Change from Multiple Sources



Re-Equip Legacy IT Staff with Modern Skillsets

On-The-Job Training Situates Transition in the Status Quo



Source: EAB Interviews and Analysis

What the Best Are Doing

To address the changing staffing needs of the IT organization, CIOs and HR departments should look for ways to supply hard-to-hire skillsets with existing talent. Our examples from progressive institutions include tactics for introducing early awareness of new technologies, leveraging cloud transition projects for on-the-job development, training cybersecurity apprentices, and using promotion pathways to make the whole IT workforce more agile.

Emerging Technology Teams

Balanced Technical/Business Teams Research Emerging Technologies

IT leadership identifies significant emerging technologies and gives selected staff members time and resources to explore their potential institutional impact. A "technology spokesperson" learns about the technical aspects of each item, joined by business analysts and relationship managers who develop use cases and design pilot projects. The goal is to ensure that institutional need rather than technical allure drives adoption.

Skills Lift-and-Shift

Existing Teams Gain Skills by Implementing Shift from On-Premises to Cloud

Transitioning on-premises enterprise systems to cloud infrastructure is used to develop legacy staff cloud skills. After a preparatory training phase, an initial tiger team of top IT performers lays out a transition architecture, followed by a second-tier team that undertakes operational tasks in the new environment. Staff buy-in is accomplished by emphasizing skills development opportunities rather than cost savings or system modernization.

Internally Sourced Cybersecurity Apprenticeship

Develop Security Talent with a Balanced Approach to Risk

Entry-level security staff are developed through a six-month institution-sponsored apprenticeship program open to existing IT staff and leading to basic cybersecurity certification. The program is built around NIST standards and is designed to mitigate risks both for candidates and for the institution. Participants may revert back to their former positions up to the three-month midpoint of the program; those who complete the program must remain with the institution for two years or repay certain training costs.

Workforce Refactoring

Upskill the Workforce with Promotions in Place

When higher-level openings become available, aggressively promote internal candidates, redistributing responsibilities where necessary to make the junior candidate a better fit. Jobs throughout the organization are "refactored" with this redistribution of responsibilities, freshening and diversifying skill sets even among those not part of the promotion event. The CIO works with HR leadership to maximize flexibility to promote in place and to redistribute assignments without undue bureaucracy.

Emerging Technology Teams

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Practice in Brief

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Key Considerations

Pursue If IT Organization…

- Has identified emerging technologies that can support strategic goals, but require further investigation and upskilling
- Can allot 5-10% of selected staff time for open-ended investigation

Don't Pursue If IT Organization…

- Lacks business partners willing to pilot or invest in emerging technologies
- Is too resource constrained to allow adequate attention to development

Reframe the Argument From:

- There are exciting new technologies on the horizon that might have an institutional impact

To:

- We understand particular technologies well enough to identify institutional use cases that merit investment

What Makes This Practice Work?

- Enough time for team members to conduct research
- Informed coordination between technologists, business analysts, and customer units to overcome superficial "gee whiz" attitudes about new technologies

Benefits to Institution

- IT staff growth opportunities
- Identify possibilities for digital transformation

"We need to show our people that IT is not all run of the mill, that they will have opportunities to try new things. That's something we have to do, because we can't compete on wages in the tight Nashville job market, so we provide opportunities to try new things that can also serve our young and discovering user-base."

Shanmuga Sundaram, Assistant Vice Chancellor IT
Vanderbilt University

Spotlight Practices

Vanderbilt University

VANDERBILT UNIVERSITY®

Emerging Technology

- Leadership selects 5 – 10 emerging technologies that may provide value to the university

Technology Spokesperson

- Volunteers based on personal interest, or manager nominated
- Allowed time to dedicate to technology research and application
- Opportunity to present viability at VU

Advantages of Encouraging Employees to Explore Technologies

- Address Skills Stagnation
- Raise Awareness of Emerging Technologies
- Earlier, Better Customer Involvement

5G IoT AR/VR 3DP

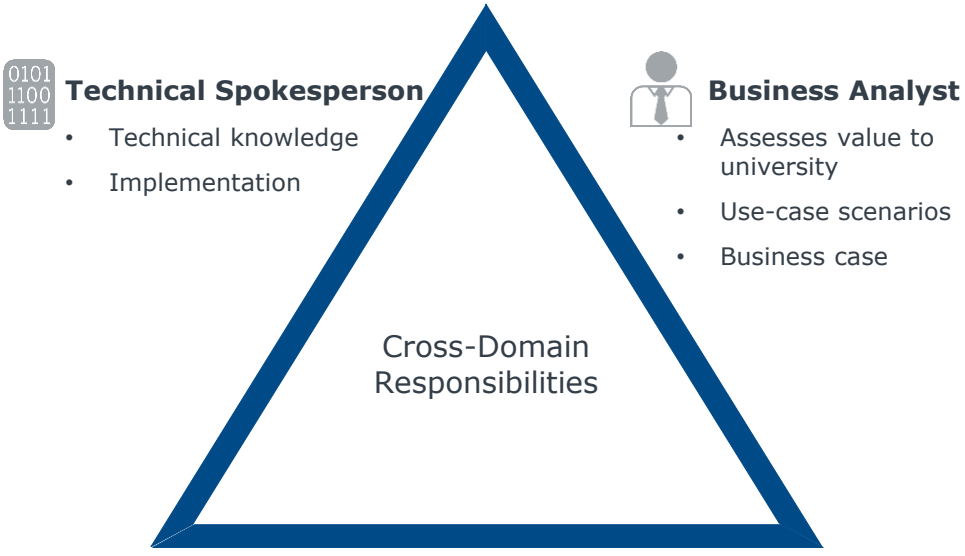
RFID Blockchain RPA

Ensure Technology Spokesperson Delivers Research to Broader Campus through Business Analysts and Relationship Managers

Discovering a Technology's True Value

Vanderbilt plan pairs technology spokespersons with business analysts and relationship managers to:

- Cross-train different specialties
- Tell holistic emerging technology story
- Fight "tech for tech's sake" narrative



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Key Considerations

Pursue If IT Organization…

- Is committed to cloud migration but staff lack cloud skills
- Is willing to accept a transitional shift of existing architecture to IaaS rather than more directly to cloud-native environment

Don't Pursue If IT Organization…

- Wishes to keep enterprise systems on-premises or is moving to cloud native solution
- Must take quickest possible route to transition

Reframe the Argument From:

- The current platform is obsolete, and the newer environment is cheaper

To:

- This is an opportunity to learn a new skillset through a cloud transition

What Makes This Practice Work?

- Earning staff buy-in by presenting transition as an opportunity, not a criticism of existing environment
- A dedicated vanguard team that develops architecture and redesigns roles
- Follow-up to optimize for the cloud environment

Benefits to Institution

- Upskills staff on cloud technologies
- Eliminate or reduce need for consultants

> You have people who are technically curious. They're going to pave the way. We were fortunate that some of our functional people were in that group, wanting to know new things."
>
> Todd Haddoway, Senior Director, IT
> *UMBC*

Spotlight Practices

University of Maryland Baltimore County

UMBC
AN HONORS UNIVERSITY

1. Upgrade Becomes a First Step toward Long-Term Enterprise Systems Cloud Strategy

Challenge: Conduct urgently needed PeopleSoft finance update using existing staff without extending commitment to on-premises deployment model.

Solution: "Lift-and-shift" to AWS cloud infrastructure, simultaneously re-skilling IT infrastructure and applications staff.

2. Messaging to IT Staff Emphasizes Opportunity

✖ **"Current platform is obsolete"**

- True in long run, but lacks urgency
- Staff highly invested in system

✖ **"New environment is cheaper"**

- Institutional costing obscures true TCO
- Raises anxiety around job security

✔ **"We need to develop new skills"**

- Invites staff to rise to challenge
- Lift & shift approach moderates disruption

3. Phased Transition Led by Vanguard Planning Group

Preparation

- **Pilot Projects**
  Ad hoc approach reveals staff need better preparation
- **AWS Training**
  Classes & conferences to gain philosophical understanding of cloud; skills languish in absence of concrete work to do

Planning Vanguard

- **Top Talent Assembled**
  Most passionate technical and functional staff selected for advance lift-and-shift work
- **AWS Architecture Committee**
  Designs and lays out proposed architecture
- **Roles Redesign**
  Meetings to rethink identity, access, control issues affected by shift

Full Transition

- **Targeted Training**
  Second-tier staff begin to learn specific operational tasks in new environment
- **Role Reorientation**
  Staff encouraged to abandon familiar repetitive tasks, learn cloud native skills

4. Next Steps

1. Optimize version 1.0 install
   - Enterprise architect working with upskilled staff to eliminate legacy design practices, e.g. unneeded redundancy
2. Launch cloud-native HR/SIS
   - New skills baseline makes cloud-native transition more feasible
   - Leverage RDS, containerization, etc.
3. Bring staff laggards up to speed
   - Though most staff have embraced the change, some remain resistant

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Key Considerations

Pursue If IT Organization …

- Has HR guidance or approval
- Struggles to hire security staff
- Can support the financial and time cost of training an apprentice

Don't Pursue If IT Organization …

- Lacks the resources to provide adequate training
- Receives a firm no from HR
- Cannot put in place protections against immediate loss of program graduates

Reframe the Argument From

- Security talent is too expensive to hire and risky to train

To:

- How can a security training program be designed to be attractive to good candidates while protecting the institution's investment?

What Makes This Practice Work?

- Securing training resources and HR support before announcing the apprenticeship
- Clear expectations with candidates about the entry-level nature of the position and the need to commit to the institution upon completion

Benefits to Institution

- Bolsters security talent pipeline
- Lowers transition barriers between IT verticals
- High apprentice retention likelihood

"I had an open level 2 position that I frankly could not hire without taking a level 1 candidate. This led to the creation of the apprenticeship."

Marc Scarborough, CISO
Rice University

Spotlight Practices

Rice University

RICE

Partner with HR to Build Program > **Design Core Training Program** > **Recruit, Select, and Train Candidates**

HR Consultation Emphasizes Fairness

CISO worked with HR to design a program that is fair, measurable, and potentially scalable to the entire university

NIST NICE Framework

Formal training and roles framework contributed to program design. NIST NICE Framework is a USA national-focused resource that categorizes and describes cybersecurity work through a cybersecurity taxonomy and common lexicon.

Training Portfolio

Training includes **Cybrary, SANS, Splunk,** and **Tenable** courses in both self-study and group formats

Learning While Doing

Roughly 20% time formal training and 80% on-the-job learning under security staff

Tier One Employee

Regardless of previous position, the apprentice is classified and paid as tier one staff

Six Month Training Window

Following successful completion of training, candidate becomes an FTE in the cybersecurity group

Candidate Position Backfill

CIO backfills candidate's original position through the apprenticeship's halfway mark

Program Timeline Balances Transition With Commitment

Day One

New Position Starts

- Seat moved to CISO reporting line
- Salary adjusted to apprentice level
- Core training begins

Three Months

No-Fault Period Ends

- Last chance for no-fault drop
- If apprentice continues, old position no longer held open
- >50% of trainings should be completed

Six Months

Official, but Committed

- Becomes an FTE with appropriate compensation
- Committed to two-year tenure
- Early departure requires repayment of $4,000 training costs

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Key Considerations

Pursue If IT Organization…

- Has HR support for a flexible and strategic approach to IT recruiting
- Struggles with talent retention and mid to senior-level hiring

Don't Pursue If IT Organization…

- Is constrained by formalistic HR policies
- Has small staff without regular promotion possibilities

Reframe the Argument From

- Internal promotion opportunities are bound by rigid job descriptions and rules that require external searches

To:

- IT hiring is guided by strategic policies that facilitate job redesign and flexible promotion pathways

What Makes This Practice Work?

- Senior HR leadership partnership and approval
- Persistent management attention to promotion possibilities including an up-to-date list of good candidates
- Communication that responsibilities and teams will be regularly refreshed

Benefits to Institution

- Incentivizes staff to develop and grow
- Instills a culture of skills development

"It fundamentally changed retention because there is a constant flow of new water coming into the lake. Everyone's assignments are changing, not just the person advanced, so expertise is constantly being developed."

Kian Colestock, Interim CIO
University of California Irvine

Spotlight Practices

University of California Irvine

UCIrvine

Challenge

Central IT was facing a high attrition rate and a culture of skills stagnation in a job market of near 0 unemployment

Solution

IT leadership created a workforce refactoring policy to ease advancement, shake up assignments, redesign unit work, and adjust vacancy skill level

Results

Workforce refactoring lowers annual IT attrition rate from 8% to 2% between 2012-2017.

Workforce Refactoring Welcomes Disruption

New Level 4 programming position opens up

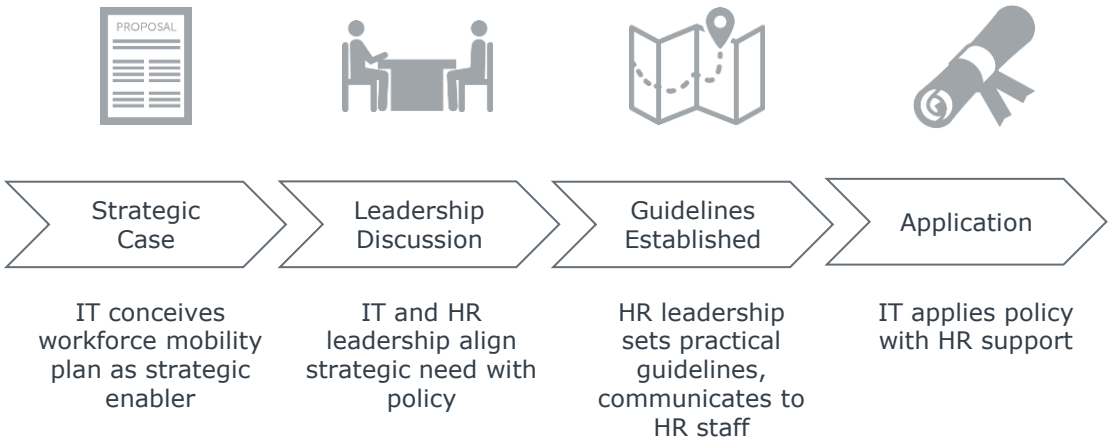
Level 3 candidate promoted to level 4 role with adjusted responsibilities

Workforce Mobility group assesses internal level 3 staff for promotable candidates

Some level 3 and 4 work moved downward, setting up other staff for potential promotion; may open L1/2/3 search

IT Overcomes Reflexive "No" from HR

Before IT adopted refactoring, IT's line HR representative often blocked staff or job changes for arbitrary policy reasons. After developing a strategic case for greater IT hiring and development flexibility, IT leadership worked with HR leadership to define clearer guidelines and eliminate obstacles to internal promotion and job redesign.



Making a Strategic Case for IT Flexibility at UCI

0% Near-zero tech unemployment Orange County

$$ Area salaries beyond UCI scales

▼ Workforce talent pipeline is top-heavy

IT Forum

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